

REMARKS

Claims 5-7, 9, 11, 12, and 14-18 are pending in the current application.

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated July 1, 2003 has been received and its contents carefully reviewed.

In the Office Action, claims 5-7, 9, 11, 12, and 14-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Related Art Figures 1A-1E and the related disclosure (hereinafter "ARA") in view of U.S. Patent No. 6,077,753 to Park et al. (hereinafter "Park") in view of U.S. Patent 6,077,643 to Kumar et al. (hereinafter "Kumar"). Applicants amend claims 7, 14, and 16 to more particularly recite the features of Applicants' invention.

The rejection of independent claims 5 and 14 is respectfully traversed and reconsideration is requested. Independent claim 5 and dependent claims 6, 7, 9, 11 and 12 are allowable over the cited references in that each of these claims recites a combination of elements including, for example, "the photoresist is coated into a thickness of 1.0 to 2.0 μ m and is soft-baked at a temperature of 100°C to 125°C... and wherein said post exposure baking is conducted at a temperature of 125°C to 145°C." None of the cited references including the ARA, Park or Kumar, singly or in combination, teaches or suggests at least this claimed feature.

The structure of claim 5 of the present invention is different from the Kumar and Park structures in that neither Park nor Kumar discuss at all the thickness of the photoresist. Therefore, it would not have been obvious for one of ordinary skill in the art at the time of the invention to form a photoresist having thickness between 1-2 μ m.

In addition, Park does not discuss at all the soft baking or the post-exposure baking temperature. Furthermore, Kumar discusses soft baking at 120°C (Kumar, column 12, lines 25-

67), which is below the 125°C recited in the claim. It would not have been obvious to one of ordinary skill in the art to soft bake at a temperature above that suggested by Kumar.

In addition, Kumar discusses post-exposure baking in a very broad temperature range from 70°C to 160°C, but it does not disclose or suggest the specific range of 125°C-145°C (Kumar, column 9, lines 58-60). This range confers additional and unexpected benefits and advantages when used in conjunction with the fabrication method as recited in claim 5.

By way of another example, claim 7 is allowable over the cited references because neither Kumar nor Park disclose the feature of “said development is conducted by an organic alkali aqueous solution” as required by claim 7. In fact, Kumar discloses that development is achieved using a “polar developer, preferably an aqueous based developer such as an inorganic alkali” (Kumar, column 9, lines 60-63). Park does not disclose or suggest at all how its photoresist is developed. Therefore, neither Park, nor Kumar, considered separately or in combination, disclose or suggest this feature of dependent claim 7.

Accordingly, Applicants respectfully submit that claim 5 and claims 6, 7, 9, 11 and 12, which depend from claim 5, are allowable over the cited references.

Independent claim 14 and dependent claims 15-18 are allowable over the cited references in that each of these claims recites a combination of elements including, for example, “the negative-type photoresist is coated with a thickness of 1.0 to 2.0 μm and soft-baked at a temperature between 120°C to 150°C before exposure, and wherein said post exposure baking is conducted at a temperature of 125°C to 145°C”. None of the cited references including ARA, Park or Kumar, singly or in combination, teaches or suggests at least this feature of the claimed invention. The structure of claim 14 of the present invention is different from the Kumar and Park structure in that neither Park nor Kumar discuss the thickness of the photoresist. Therefore,

it would not have been obvious for one of ordinary skill in the art at the time of the invention to form a photoresist having thickness between 1-2 μm .

As noted earlier, Park does not discuss at all the temperature of the soft baking or the post-exposure baking. Furthermore, Kumar discusses soft baking at 120°C (Kumar, column 12, lines 25-67), which is well below the 150°C recited in the claim. It would not have been obvious to one of ordinary skill in the art to soft bake at a temperature so substantially greater than that suggested by Kumar.

In addition, Kumar discusses post-exposure baking in a very broad temperature range from 70°C to 160°C, but it does not disclose or suggest the specific range of 125°C-145°C (Kumar, column 9, lines 58-60). This temperature range confers additional and unexpected benefits and advantages when used in conjunction with a fabrication method as recited in claim 14. Furthermore, it would not have been obvious for the combined teachings of the ARA, Park, and Kumar to soft bake at a temperature higher than the post-exposure baking temperature.

By way of another example, claim 16 is allowable over the cited references because neither Kumar nor Park disclose the feature of “developing the negative-type photoresist uses an organic aqueous alkali solution” as required by claim 16. In fact, Kumar discloses that development is achieved using a “polar developer, preferably an aqueous based developer such as an inorganic alkali” (Kumar, column 9, lines 60-63). Park does not disclose or suggest at all how its photoresist is developed. Therefore, neither Park, nor Kumar, considered separately or in combination, disclose or suggest this feature of dependent claim 16.

Accordingly, Applicants respectfully submit that claim 14 and claims 15-18, which depend from claim 14, are allowable over the cited references.

Applicants believe the foregoing amendments place the application in condition for allowance and early, favorable action is respectfully solicited.

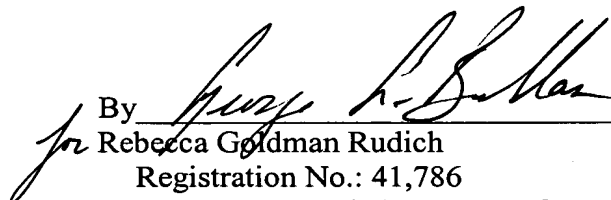
Applicants believe the foregoing amendments place the application in condition for allowance and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

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